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ABSTRACT

Technology planning policy in Michigan has been reviewed and revised through research on local school districts, with an emphasis on the effects of planning on program outcomes. This paper is a case study in the impact of research on practice as it evolved in relation to technology planning in Michigan. This paper reviews the study results and the resulting policy changes, including presentation of a rubric developed for scoring technology plans. It is designed as a focus for discussion rather than a detailed report of research findings. Study results are documented fully in an earlier report (E. Hoffman, 2001). Study findings identify some weaknesses and strengths in current plans, and result in some identified implications for educational policy. These include the following: (1) good plans do not necessarily equal good programs; (2) policies that encourage good planning processes are likely to be successful than those that encourage good writing; (3) policies should provide for planning focus on student outcomes and classroom learning rather than technology; and (4) policies need to encourage data-driven decision making. These issues have been considered in the technology planning rubric developed for Michigan schools that was tested during the summer of 2001 and distributed in the fall. (Contains 2 figures and 34 references.) (SLD)

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Discussion Questions:

- How can researchers impact policy?
- How do we know technology planning is worth the time?
- What is required to conduct quality research on policy implications as it relates to technology integration? Are there specific pitfalls that should be considered?
- With new planning requirements in the recent federal "No Child Left Behind Act," is technology policy headed in the right direction?

Abstract: Technology planning policy in Michigan has been reviewed and revised through research on local school districts, with an emphasis on the effects of planning on program outcomes. This paper reviews the study results and the resulting policy changes, including presentation of a rubric developed for scoring technology plans. It is designed as a focus for discussion rather than a detailed report of research findings. Study results are fully documented in an earlier report (Hoffman, 2001)

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Introduction

This paper is a case study on the impact of research on practice as it evolved in relation to technology planning policy in Michigan. When a researcher began to dig into the Michigan Department of Education's archives of state-approved technology plans, the study came to the attention of state officials who had responsibility for approving district plans. As a result, the study not only gained official support but came to be the foundation for changes in planning policies. At the same time, some of the findings continue to be problematic, as these do not fit the federal policies, which in the end are the overriding factor in state policy making.

History

Technology in schools has been cited as a means to improve learning, increase accountability, power school reform, decrease the digital divide, and provide the tools needed by today's students to become tomorrow's knowledge workers (Bozeman, 1998; Conte, 1997; Cuban, 2001; Glennan & Melmed, 1996; Gooden, 1996; Kerr, 1996; Maurer & Davidson, 1998; Mehlinger, 1995; Puma, Chaplin, & Pape, 2000; Reich, 1991; Sandholtz, Ringstaff, & Dwyer, 1997; Thornburg, 1999; U.S. Department of Education Office of Educational Technology, 2000). However, the high hopes for the effects of technology in classrooms have yet to be realized. Many recommendations have been made to address this gap between expectations and practice. Among these, technology planning has been proposed and even mandated as a key policy tool for guiding schools to improve technology implementation and assure long-term adoption of reforms.

While many practices have been proposed that claim to be the right formula to make a difference in what has been the seemingly limited implementation and adoption of technology to date in the classroom, a

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consistent recommendation is the development of a formal technology plan (Barnett, 2001; Cradler & Bridgforth, 1995; EDvancenet, 1998; Lumley & Bailey, 1997; Picciano, 1998, 2002; Recesso & Carll, 1999). As a result, written technology plans are not only advised but even mandated by federal and state policy despite a yet-to-be-proven record of success (Cuban, 1998, 2001).

Does Planning Work?

While multiple guidelines have been proposed for how technology planning can improve the change process (Brody, 1995; Fishman & Pinkard, 2001; *Guidebook for developing an effective instructional technology plan*, 1996; Lumley & Bailey, 1997; Picciano, 1998; Sturgeon, 2001; Sun, Heath, Byrom, Phlegar, & Dimrock, 200), these prescriptive methods have not been proven to lead to effective implementation and adoption of educational technology. In fact, despite many research studies that have looked at technology plans, few have demonstrated that methodical technology plans produce better results (Brush, 1999; Cuban, 2001; Fishman & Pinkard, 2001; Miller, 1999). With limited evidence to support the claims of technology planning advocates for successful results from particular formulas, critics have raised multiple concerns about the efficacy of prescribed planning methods although few have proposed that technology planning as a tool be eliminated.

While technology planning has a history that goes back to the early1980s with recommendations about its efficacy for school technology programs (Pogrow, 1983), an increased emphasis on planning began in the 1990s with federal legislation that required schools receiving federal technology funds to have state-approved technology plans. First appearing in legislation for Goals 2000, the major push followed the 1976 Universal Service Fund program, one that impacted over 90% of schools in the country. Planning requirements continue in the 2001 "No Child Left Behind Act," reflecting both a continuing belief in the power of planning to positively impact program implementation while evolving the focus of plan content.

The Michigan Background

In Michigan, the USF federal policy had a major impact as the state did not have a process in place to review and approve technology plans. Because the state does not have a program that provides regular state funding for school technology, planning had never been a state-level issue. A few districts created plans in the early 1990s to guide their own technology programs, but most did not follow this recommended process until needed in their first applications for E-rate funds (Hoffman, 2001).

In order to assure that Michigan schools would be eligible for these federal funds, the Michigan Department of Education rapidly developed a process for receiving and approving technology plans in 1997. The federal guidelines for required elements in school technology plans were put into a nine-point checklist that outlined what would be required for plan approval. Districts were required to write up their plans, show where in the plans the required items appeared, send them on to their local intermediate school district for an initial review, and then on to the state for final approval. Using this process, Michigan approved almost 800 technology plans for school districts, private schools, charter schools and intermediate school districts in less than six months (Michigan Department of Education Office of Data, 2000).

The Research Begins

The approved plans provided a high-quality archive to study technology planning. As a result, these plans became the basis for a study conducted in 1999-2000 to determine whether there was in fact a positive relationship between planning and implementation as had been previously asserted in technology planning literature (Hoffman, 2001).

The research study used the methodology of process evaluation (Vedung, 1997) to examine the relationship of technology planning to implementation in Michigan public school districts. Both quantitative and qualitative methods were applied to examine the question of whether good technology plans are a requisite for high technology school districts.

Data were collected from multiple sources about technology planning and implementation in a random sample of 115 of the 555 school districts in Michigan. Private, charter and intermediate school districts were not included in the study.

Data sources included public and commercial databases, researcher reviews of technology plans and district web sites, and material obtained from surveys of superintendents, technology coordinators, and high school media specialists from the sample districts. Additional historical material was obtained from the researcher's work with school leaders in Michigan and the Michigan Department of Education related to improving the technology planning process under a Technology Literacy Challenge Fund award. Statistical analytic methods were used to examine the relationships among technology plans, planning processes, demographic factors, and technology program outcomes. Where it provided additional information to enhance the understandings from these tests, qualitative data were included in the analysis as these were relevant.

Of the sample districts, 106 districts had approved plans on file with MDE; the other nine districts had no plans. All 106 plans were read for the study and coded for content presence and quality. In addition, survey responses were received from at least one individual in 94.5% of the districts, with 25% returning all three possible responses. Data from public and private databases, including an estimate of technology levels, were available for all 115 sample districts.

Qualitative and quantitative techniques were used to analyze the data collected. Statistical methods, including descriptive and inferential statistics and correlational and multivariate techniques, were used to compare the collected data from actual technology plans. Document analysis techniques were used to determine whether textual references provided additional material that was relevant to a district's process, and test whether these were common to multiple plans studied. Baseline data obtained from Michigan Department of Education statistical records were examined to determine if there was a significant correlation with variables such as size, geographical location, or financing that affected implementation levels or levels of integration. Surveys were analyzed using descriptive and inferential statistical methods to compare data from respondents within and between districts. All results were tested for significance at the .05 level.

Summary of Research Findings

The following are a summary of some of the study findings. Details of the analyses and results are documented in an earlier report (Hoffman, 2001). The intent here is to provide brief descriptions of findings which can contribute to the discussion of the paper.

Weak written plans. Despite the written guidelines, many plans were lacking required elements and all were uniformly weak in terms of depth of coverage. Further, well written plans were often the result of heavy "borrowing" of text from other sources, sometimes through the use of templates or in other cases by hiring an external consultant with experience in plan development.

Technical better than curricular. Plans were better on technical content than curricular focus. Deploying equipment was more fully documented than the uses for the technology in the classrooms, instructional content, or professional development to train teachers to use the new technology.

Vision and participation best documented. Sections on vision and descriptions of the planning process noting broad stakeholder participation were consistently the most developed sections of the reviewed plans. In general, there seems to be a bias that those sections that are easier (and less controversial) to write are better developed.

Better participation equaled better plans. Plans were better when participation in planning was broader. In particular, having good representation from building level staff (teachers and media specialists) was a key to improved sections on curriculum and professional development. By contrast, use of consultants improved only the technical implementation content.

Revised plans only slightly better. The one-third of the districts that had a prior technology plans did only slightly better than those with new plans in content inclusion and quality, with most still missing major areas. Districts without plans were more likely to mention having very limited technology programs at the time their first plan was written.

Size matters. Very small districts were least likely to have a technology plan, and as a result, were not able to obtain federal funds even when eligible. In most cases, these districts represent very small, rural areas in the state.

Money matters. While various factors including per pupil funding and socioeconomic status did not affect the overall quality of technology plans, these were highly correlated with improved implementation of technology programs. These districts also were more likely to have a more inclusive technology planning process.

Good plans did not equal good programs. By contrast, better plans did not correlate with any implementation variable in the study. The more important finding is that better planning *processes* were related to implementation even beyond the large influences of economics.

No evidence of improved student achievement. When planning and implementation were examined in terms of student achievement, there was no relationship found to better plans or higher levels of implementation. As indicated from many other studies, economic variables were a far better predictor of student achievement.

More grants with better plans. The single place where good plans seemed to make a difference was that districts with better plans were more likely to be successful in obtaining grant funding related to technology, even when economic factors were considered.

Overall, Michigan schools are behind national averages for computer implementation. The absence of sustained funding from the state and heavy reliance on federal programs for technology have impacted the levels of computer implementation. Even the best districts studied were achieving the level that was being reported as average in studies comparing states from the same period.

Confusion reigns. An unexpected consequence of the study was the result that there were significant differences among survey responses from individuals in the same district on survey items even for answers in which there should have been a clear (and singular) numeric answer or a simple dichotomy. Superintendents, technology coordinators, and media specialists often disagreed about what was happening in their districts. In most cases, superintendents painted a rosier picture of district technology practices than was reported by other district respondents. Districts with higher implementation levels were more likely to have agreement among respondents about district activities, although this represented too small a group to show statistical significance.

Technology plans gather dust? When asked questions about the quality and influence of plans in their districts, respondents answers had no correlation with the actual quality scores of the plans on file. By contrast, those rating their plans higher were more likely to have a good planning *process* in place and perceived success in implementation.

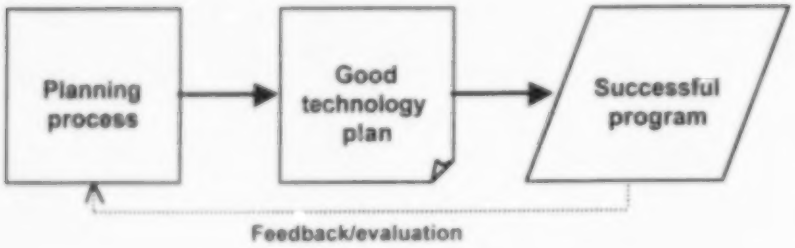
Although no comprehensive follow-up study has been completed, about one-quarter of Michigan school districts have since completed a new plan for state approval. Reports from plan evaluators indicate that many of the issues raised in the initial study of technology plans continue. Updated plans were determined to be better in terms of the technical rather than curricular focus, lacked clear implementation detail such as timelines, budgets, and evaluation, and too often were focused on what a plan should contain rather than on the actual program a district intended to follow. Many failed to have a clear description of present status and have details for how goals would be achieved. The largest improvement is that most districts have an ongoing planning process that is broad based and most are satisfied that they had achieved the technology aspects of their earlier plans (Hoffman & King, 2002).

Policy Implications

Good plans do not necessarily equal good programs.

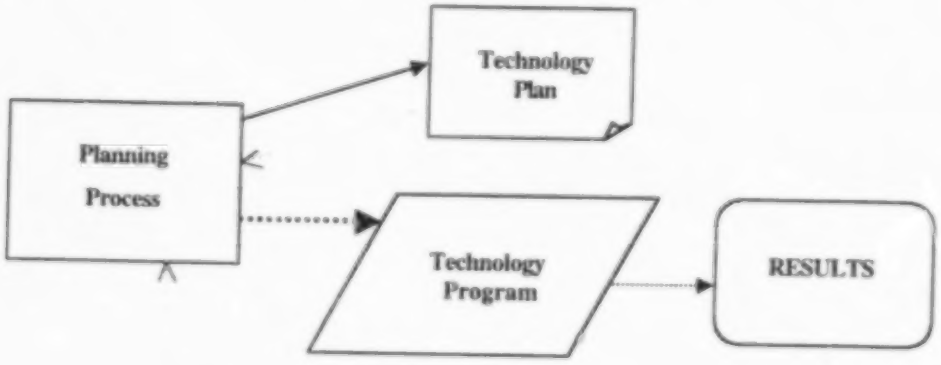
What the study suggests is that the standard assumption that having a good technology plan leads to a successful technology program may be simplistic. The standard assumption can be seen as follows:

Figure 1. The Old Planning Paradigm



The reality is that while the process does have at least some effect, based on the present research, the written plan itself is not directly in the line to improved implementation. It could be viewed more like the following:

Figure 2. A Revised Planning Paradigm



In fact, a very good writer may be able to produce what appears to be an excellent plan even in the absence of a good planning process. As a result, studies which are designed to evaluate the content of a plan may produce spurious results in the absence of an understanding of the process which produced it.

Policies which encourage good planning processes are likely to be more successful than those which encourage good writing.

Given findings that suggested that better processes were related to better programs, the focus of policies intended to ensure accountability for technology funding may do better if these encourage the process rather than the written output. While it is easier to evaluate a written document than understand the complexities of a district planning process, the guidelines might be tailored in ways that promote best practices. Further, the idea of a dynamic plan rather than a static document that is simply filed after being sent for approval to the state should be encouraged.

Policies should provide for planning focus on student outcomes and classroom learning rather than technology.

Although most planning recommendations argue for inclusion of both technical and curricular integration content, better plans are those which began with use and then applied technology as the means to achieve specific learning goals. Because most planning guides begin with sections on technology, planning teams too often start in the wrong place. In addition, very broad vision statements in the reviewed plans included platitudes like "all our children will be prepared for the 21st century" with very little attention to what such

an outcome would look like or how that would relate to classroom teaching and learning. When plans were tightly linked to school improvement plans and content standards, they were more likely to be from districts that had better implementations. To some degree, this issue is being addressed through the shift in planning focus that is included in the "No Child Left Behind Act."

Policies need to encourage data-driven decision making.

The unexpected emergence of the issues of non-conforming survey responses suggest that district personnel are not on the same page when it comes to their technology planning and implementation. Issues of communication, leadership, and shared vision and understanding are all concerns to which these findings point. Policies which encourage districts to collect and share data among stakeholders have potential to have greater impact than those that place emphasis on the preliminary stages of the planning process. Goal setting is not enough to ensure follow-through or even be remembered after the plan is filed.

From Research to Practice

The research study provided a base for a reconsideration of Michigan's technology planning approval process. Based on the findings, the state reexamined and revised its policies. While much of the structure of the process and the overall guidelines are still determined by federal regulations, the state implemented a program of outreach, training, and improved resources to support district planning efforts that used the study findings (Hoffman & King, 2002).

The new resources developed in a partnership among the Michigan Department of Education, one of the state's intermediate school districts that has been a leader in training for technology planning, and the researcher, include a model template, a web site with resources and planning information (http://www.techplan.org), and a technology planning rubric (Michigan Department of Education, 2001). The rubric, "The Technical Assistance Guide for Technology Plan Approval," indicates the basic level expected in technology plans that is predominantly shaped by the federal guidelines, but also includes an advanced level that is designed to encourage practices that were suggested by the research study. Training sessions have been held throughout the state to introduce the resources, with a particular focus on evaluation as part of the planning process.

The rubric was tested during the summer 2001, and was distributed to districts beginning last fall. While the rubric is described as a guide rather than a mandate, district representatives have indicated that the rubric framework is assisting in the planning process, providing a useful tool for planning teams working on revising earlier plans. Plans using the new rubric are just starting to arrive for state approval so the effect of this tool is still under study.

One benefit of the tools developed as a result of the research is that Michigan has helped districts with the areas that are emphasized in the "No Child Left Behind Act." With an increased focus on curriculum integration and professional development, the new federal directions for technology planning fit well with the state's rubric already being used in the state. While the final federal guidelines for technology planning under the act remain to be released, the directions already taken at the state level are expected to ensure that Michigan districts are well prepared for the new planning directions.

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